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## PROBING ALGORITHM FOR FOUNDATION FIELDBUS PROTOCOL

## ABSTRACT OF THE INVENTION

A hand-held communication control device which, when coupled to a process control system communication bus, controls communication occurring on the bus using a communication schedule that dictates when each of the devices coupled to the bus will be permitted to communicate on the bus. The hand-held communication control device further uses a probing algorithm to detect devices, including other communication control devices, that are coupled to the bus. The probing algorithm causes the hand-held communication control device to select an address from one of a set of three address lists to which a probe node message is then transmitted to detect the presence of a device at that address. One of the address lists is reserved for communication control devices and uses only a limited number of maximum possible addresses. The probe addresses are selected from each of the three address lists in a sequential manner and from among the three address lists in an alternating manner so that, when the communication control device takes control of a bus formerly controlled by another communication control device, the hand-held communication control device detects the presence of the other communication control device and relinquishes control of the bus to the other communication control device in a timely manner.